Strengthening Carbapenems Usage Monitoring Through Antimicrobial Stewardship Programme as an Effective Measure in Reducing Carbapenem-Resistant Enterobacterales (CRE) Cases – A Single Centre Experience from Miri Hospital, Sarawak, Malaysian Borneo.

APCCMI2025 BANGKOK

RES-052

Authors
Tonnii Sia[1,2], Salasiah Jaidil[2], Ling-Weng Wong[3], Mohd Taha Ariff Isa Ali[3], Lee-Hwa Chu[4], Nurul Aimi Abdul Rahman[4], Nancy Uhai[2], Siew-Moi Chang[2], Marylisa Abai[2], Siew-Chen Ten[2]

[1] Infectious Diseases Unit, Department of Medicine, Miri Hospital, Sarawak, Malaysia.
[2] Infection Control Unit, Miri Hospital, Sarawak, Malaysia.
[3] Department of Pharmacy, Miri Hospital, Sarawak, Malaysia.
[4] Microbiology Unit, Department of Pathology, Miri Hospital, Sarawak, Malaysia.
Corresponding author: Dr Tonnii Sia (tonnii_sia@ moh.gov.my)

Background

Carbapenem-resistant Enterobacterales (CRE) is an alarming hospital-acquired infection in Malaysia (1). It carries high mortality and limited treatment options (1). CRE are driven by broad-spectrum antibiotic use, especially carbapenems (2). Miri Hospital is the sole government-funded tertiary centre in Northern Sarawak. Since 2020, CRE cases have risen significantly, from 2–3 cases annually in 2018–2019 to 30–40 cases annually, between 2020-2023.

Methods

This is a retrospective analysis of CRE surveillance and antimicrobial consumption data from 2018-2024. Antimicrobial consumption is measured using the Defined Daily Dose (DDD). Since June 2023, Antimicrobial Stewardship Programme (ASP) was strengthened to ensure carbapenem use was compliance with national antimicrobial guideline (NAG) (3).

Result

106 CRE cases were recorded during study period. 48.1% (n=51) was isolated from blood, 22.6% from respiratory tract secretions, 14.1% from urine and 15.1% was from other samples. 75.5% (n=80) were classified as infection and others as coloniser. A sharp increase in CRE cases was observed from 2020-2023 (Figure 1). COVID-19 pandemic caused low admission in 2021. The median meropenem DDD increased from 2.95 prior to 2020 to 9.20 in 2022. The rise in CRE cases paralleled an increase in meropenem usage. Following intensified ASP efforts (timely 72 hours reviews of treatment indications, evaluation of microbiological culture results, and strict adherence to NAG), the median meropenem DDD declined to 5.52 in 2024 and so as the number for CRE cases. Number of ESBL isolates did not increased prior to 2022 indicated that the usage of meropenem was empirical (Figure 2). Total ESBL isolates remained stable.

Figure 1

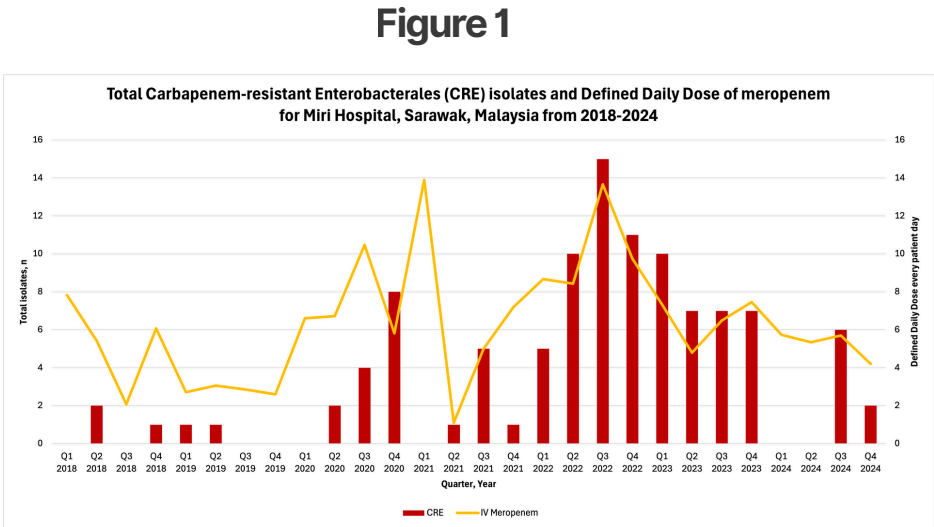
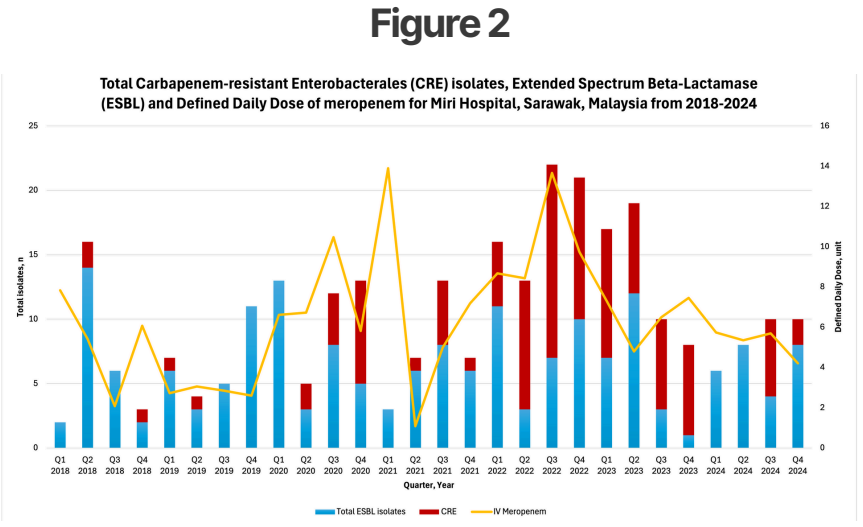


Figure 2



Conclusion

Strengthening ASP is effective in reducing hospital-acquired CRE. Judicious use of carbapenem is crucial, especially if it's for empirical therapy. Continuous prescriber education and regular feedback on antimicrobial use are essential.

References

1 Chuah CH, Gani Y, Sim B, Chidambaram SK. Risk factors of carbapenem-resistant Enterobacteriaceae infection and colonisation: a Malaysian tertiary care hospital based case-control study. *J R Coll Physicians Edinb*. 2021;51(1):24-30.
2. Zawani RD, Ramli R, Abdu Bakar Zidik TMIT, Naina-Mohamed I, Leong CL. Clinical Characteristics and Risk Factors of CarbapenemResistant Enterobacteriaceae: A Case-Control Study in a Tertiary Hospital in Malaysia Malaysian. *Journal of Medicine and Health Sciences*. 2021;17(4):189-95.
3. MOH Malaysia. *National Antimicrobial Guideline 2024*. https://sites.google.com/moh.gov.my/nag [Accessed 15th May 2025].

DOWNLOAD

CONTACT